

CLAIMS

1 1. A method for dynamically updating a property of a live object at remote
2 clients, comprising:
3 receiving a first message from a remote input source, the first message
4 identifying the live object and containing data for updating a property
5 of the live object;
6 identifying remote clients that have registered for updates to the live object,
7 wherein the remote clients are distributed on a network; and
8 routing a second message via the network to the registered clients, the second
9 message identifying the live object and containing the data for
10 updating the property of the live object;
11 wherein the registered clients are adapted to process the data to cause the
12 update to the property of the live object.

1 2. The method of claim 1, wherein the live object is identified by an object
2 ID.

1 3. The method of claim 2, wherein the object ID comprises a hierarchical
2 namespace.

1 4. The method of claim 1, wherein the live object is identified as a point in a
2 document object model.

1 5. The method of claim 1, wherein the data for updating the property of the
2 live object identify the property relative to a point in a document object model.

1 6. The method of claim 1, further comprising:
2 receiving a registration request from a client, the registration request
3 identifying the live object with an object ID.

- 1 7. The method of claim 1, further comprising:
2 receiving a request from a client for an activation module, the activation
3 module adapted to identify any live objects at the client; and
4 providing the activation module to the client.
- 1 8. The method of claim 1, wherein a client is adapted to generate a
2 registration request registering for updates to properties of live objects at the client.
- 1 9. The method of claim 1, wherein each registered client is adapted to
2 generate executable code responsive to the data in the second message and execute the
3 executable code to cause the update to the property of the live object.
- 1 10. The method of claim 1, wherein the data for updating a property of the live
2 object comprise an executable script and wherein each registered client is adapted to
3 execute the executable script.
- 1 11. The method of claim 1, wherein the second message identifies a handler
2 for updating the property of the live object responsive to the data in the second message.
- 1 12. The method of claim 11, wherein the second message implicitly identifies
2 the handler.
- 1 13. The method of claim 11, wherein the second message explicitly identifies
2 the handler.
- 1 14. The method of claim 1, wherein the change to the property of the
2 identified live object is associated with a visual representation of the object at a client.
- 1 15. The method of claim 1, wherein the change to the property of the
2 identified live object is not associated with a visual representation of the object at a client.

1 16. The method of claim 1, further comprising:

2 processing the first message from a first format to a second format to produce
3 the second message.

1 17. The method of claim 1, wherein the first message and the second message

2 are identical.

1 18. A dynamic content routing network for enabling updating a property of a
2 live object at a client coupled to the network, comprising:

3 a node for receiving a message from a remote input source, the message
4 identifying the live object and containing data for updating a property
5 of the live object, for maintaining a registry of remote clients coupled
6 to the network that have registered to receive updates to properties of
7 the live object, and for routing the message to the registered clients;
8 wherein each registered client is adapted to process the data to cause the
9 update to the property of the live object.

1 19. The routing network of claim 18, further comprising:

2 a gateway in communication with the node and the input source and adapted
3 to receive the message from the input source and deliver the message
4 to the node.

1 20. The routing network of claim 19, wherein there are a plurality of gateways,
2 further comprising:

3 a load balancer for balancing a load on the routing network by distributing
4 messages from the input source among the plurality of gateways.

1 21. The routing network of claim 18, wherein the node is further adapted to

2 receive registration request messages from the clients, the registration request messages

3 registering for updates to properties of the live object.

1 22. The routing network of claim 21, wherein there are a plurality of nodes,
2 further comprising:
3 a load balancer for balancing a load on the routing network by distributing the
4 registration request messages from the clients among the plurality of
5 nodes.

1 23. The routing network of claim 18, further comprising:
2 an application server for serving an activation module to the clients, the
3 activation module adapted to enable identification of live objects at the
4 clients.

1 24. The routing network of claim 23, wherein the activation module is further
2 adapted to generate a registration request from a client to the node for registering to
3 receive updates to properties of the live object.

1 25. The routing network of claim 23, wherein the activation module is further
2 adapted to receive the message routed to the registered clients and process the data to
3 cause the update to the property of the live object.

1 26. The routing network of claim 18, further comprising:
2 a queue module for holding messages from the input source that have been
3 received but not yet processed by the node.

1 27. The routing network of claim 18, wherein the registry maintained by the
2 node comprises:
3 a data structure identifying live objects for which clients have registered, and
4 an address of each registered client.

1 28. The routing network of claim 18, wherein there are a plurality of nodes
2 and wherein at least some of the nodes receive the message from the input source.

1 29. The routing network of claim 19, wherein there are a plurality of gateways
2 and a plurality of nodes in each of a plurality of clusters and wherein each gateway within
3 a cluster maintains a communications link with each node within the cluster and wherein
4 each gateway within a cluster maintains a communication link with at least one gateway
5 in each of the other clusters.

1 30. A computer program product comprising:
2 a computer-readable medium having computer program code embodied
3 therein for updating properties of live objects at a client, the computer
4 program code adapted to perform the steps of:
5 identifying the live objects at the client;
6 receiving via a network an update message identifying a live object at the
7 client and containing data for updating a property of the live object;
8 and
9 processing the data to cause the update to the property of the live object.

1 31. The computer program product of claim 30, wherein the step of
2 identifying the live objects at the client comprises the step of:
3 analyzing a web page displayed at the client to identify object IDs of live
4 objects on the web page.

1 32. The computer program product of claim 30, wherein the step of
2 identifying the live objects at the client comprises the step of:
3 receiving data responsive to a solicitation of input, the data identifying the live
4 objects at the client.

1 33. The computer program product of claim 30, wherein the program code is
2 further adapted to perform the step of:
3 sending via the network a registration message indicating the live objects
4 identified at the client to a remote routing network;
5 wherein the update message is received from the remote routing network.

1 34. The computer program product of claim 30, wherein the program code is
2 further adapted to perform the step of:
3 maintaining a connection with a remote routing network;
4 wherein the update message is received from the remote routing network.

1 35. The computer program product of claim 34, wherein the program code is
2 further adapted to perform the step of:
3 terminating the connection with the remote routing network responsive to an
4 action occurring at the client.

1 36. The computer program product of claim 30, wherein the live object is
2 identified as a point in a document object model.

1 37. The computer program product of claim 30, wherein the step of processing
2 the data to cause the update to the property of the live object comprises the step of:
3 changing a property of a point in a document object model.

1 38. The computer program product of claim 30, wherein the processing step
2 comprises the steps of:
3 generate executable code responsive to the data in the update message; and
4 executing the executable code to cause the update to the property of the live
5 object.

1 39. The computer program product of claim 30, wherein the data for updating
2 a property of the live object comprise an executable script and wherein the processing
3 step comprises the step of:
4 executing the executable script.

1 40. The computer program product of claim 30, wherein the update message
2 specifies a handler for changing the property of the live object responsive to the data in
3 the update message.

1 41. The computer program product of claim 40, wherein the update message
2 implicitly specifies the handler.

1 42. The computer program product of claim 40, wherein the update message
2 explicitly specifies the handler.

1 43. The computer program product of claim 30, wherein the step of processing
2 the data to cause the update to the property of the live object comprises the step of:
3 changing a property associated with a visual representation of the identified
4 live object.

1 44. The computer program product of claim 30, wherein the step of processing
2 the data to cause the update to the property of the live object comprises the step of:
3 changing a property not associated with a visual representation of the
4 identified live object.

1 45. A system for updating properties of live objects at a plurality of remote
2 clients, comprising:
3 a routing network in communication with the plurality of remote clients, the
4 routing network adapted to enable the plurality of clients to register to
5 receive updates to properties of live objects, to receive an update

6 message from a remote input source including data for updating a
7 property of an identified live object, and to route the update message to
8 the remote clients that have registered for the identified live object;
9 wherein each registered client is adapted to process the data to cause the
10 update to the property of the live object.

1 46. The system of claim 45, wherein each client executes an activation module
2 adapted to enable identification of live objects at the client and register for updates to
3 properties of the identified live objects with the routing network.

1 47. The system of claim 46, the routing network is further adapted to provide
2 the activation module to the clients.

1 48. The system of claim 45, wherein the remote input source is adapted to
2 utilize a director console module to provide the update message to the routing network.

1 49. The system of claim 45, wherein the input source is adapted to utilize a
2 content management system module to provide the update message to the routing
3 network.